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ABSTRACT

This study compares patterns of resource allocation in school districts with different enrollment experiences ranging from substantial growth to substantial decline. In general, the study focuses on examination of the "parameters of adjustment" of public school systems with varying growth histories. Colorado was selected because some of its characteristics made it an ideal region for the implementation of the study. Some of the major hypotheses to be considered are (1) the pattern of resource allocation is significantly different among the growing and declining enrollment systems, (2) levels of student achievement differ among school systems encountering different growth rates, (3) the level and structure of the staff has a tendency to stabilize in the negative growth systems, and (4) the rate of innovation is retarded in the systems encountering stable or negative enrollments. The study is organized into three major sections. The first describes the data collected and performs a preliminary analysis. The second formulates and analyzes a questionnaire used to test the responses of administrators to decline. The last section uses a case study approach to further analyze the effects of decline on the local school district. (Author/IRT)

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ADJUSTMENTS OF COLORADO SCHOOL DISTRICTS TO DECLINING ENROLLMENTS

by MARK RODEKOHR

WITH AN INTRODUCTION BY
Kenneth E. Boulding

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ADJUSTMENTS OF COLORADO SCHOOL DISTRICTS TO DECLINING ENROLLMENTS

Mark Rodekohr
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Introduction

America, and indeed most of world society, has enjoyed growth in many different forms for a period far beyond living memory, stretching back indeed for some hundreds of years. In the last 100 or 200 years growth in almost all major respects has been quite rapid. There has been growth in population, growth in real income, growth in the educational system, and even those sections of society which have suffered relative decline like agriculture have not always suffered absolute decline. Decline, therefore, whether in population or in the absolute size of any segment of society is a rare experience. Many rural communities in the last 100 years have suffered absolute decline in population. Certain industries such as mining, where the mines become exhausted, have likewise suffered absolute declines. These segments of society are small compared with the very large sections which have enjoyed growth. Growth, however, cannot go on forever. There is now widespread recognition that we may be in for a period of general slowdown, certainly in population growth and quite probably in per capita real income as energy and materials sources become more scarce and more expensive, and as potentials for technological change begin to exhaust themselves. Furthermore, economic growth may slow down simply because the technologically advancing industries like agriculture decline as a proportion of the economy and the technologically stationary industries like education expand.

There is grave potential danger in this situation. All our institutions and habits of mind have survived because they have been well adapted to long periods of growth. Stationary cultures like the Amish have barely maintained themselves, and only then by extreme isolation in the middle of the vast onrush of developing society. In a long period of growth a strong selective mechanism ensures that those who come to a position of leadership do so because they have been well adapted to periods of growth. Even a period of

slowdown, therefore, may create severe problems simply because all our learning processes have taught us to adapt to growth and we have had very little opportunity to experience no-growth or even slow growth and still less opportunity to experience decline. The slower the overall growth of the system whether in population, per capita income or any other indicator, the larger the proportion of communities and segments of the society which will be experiencing decline. Even in a period of rapid growth a few segments of society experience decline, whereas in a period of no-growth we should expect at least half of the organizations and communities of the society to experience decline and the other half to experience growth. Around the mean, of course, growth and decline will both be small, but one should expect about a third of the organizations in a stationary society to experience a noticeable or significant decline.

Adaptation to decline, therefore, is going to be a very important skill in the years ahead. If we are only adapted to growth, then we are likely to make a tragic mess of decline. There is a strong case to be made for the argument that decline requires greater skill, better judgment, a stronger sense of community, and a higher order of leadership than growth does. It is easy to adjust to growth. If you make mistakes, time will generally correct them. If you put too much into one segment of the system, all you have to do is wait a little while and hold back the growth of the overextended section and the other sections will catch up with it. In decline, however, time aggravates mistakes. It makes it much harder to achieve the proper proportions of the system, as it is the achieving of these proper proportions which is one of the major functions of leadership.

It would seem to be good strategy, therefore, at the present moment to devote intellectual resources to the study of decline so that we may be better informed about what kinds of strategy are successful, what sort of leadership adapts best, and what kind of institutions have survival value in declining situations, as these may be very different from what are appropriate to situations of rapid expansion.

The following study by Dr. Mark Rodekohr, "Adjustments of Colorado School Districts to Declining Enrollments," is a significant step in the direction of the study of decline, or negative growth. It concentrates on the adjustments of school districts to declining enrollments. Colorado was selected for the field of study partly because of convenience and also because it

is in many respects a highly representative state within the United States, with most of its social indicators very close to the mean. It is also a state in which considerable areas have been subject to declining population, and especially declining school population, while other areas have rapid increase. The educational system is the first major segment of society after the obstetrical profession to experience decline following a decline in fertility.

Figure 1 (page 10) is a dramatic indication of what has happened to fertility since the late 1950's. We do not really know, of course, whether what we are observing is simply a temporary decline. The course of fertility from 1900 to 1960 certainly suggests a long 60-year fluctuation, though just as one swallow doesn't make a summer, one fluctuation doesn't make a cycle. It would be most dangerous to conclude from the figure that we are simply in the downswing of a cycle like the period from 1910 to 1930 and that we are due for a similar upswing in another ten years. The low fertility of the '30's was, of course, associated with the Great Depression. The low fertility of today is associated with a period of unprecedentedly high incomes and expanded educational opportunities. It is possible, of course, that like Rumania the United States will go into what I have been calling "fertility shock." The Rumanian government discovered in 1966 that Rumanian fertility had fallen below the replacement level and almost in a panic abortion was virtually prohibited and the import of birth control devices severely curtailed. The results were spectacular. Rumania had about ¼ million children in 1966 and about ½ million in 1967. It is the only country in the world, indeed, that ever doubled its birth rate in one year. Since then, of course, fertility has been declining again, but it is still far above the level it was in 1966. It is by no means impossible that this could happen in the United States, and that we may see another upsurge in fertility whether through government policy or through a change in general societal patterns as we move into the '80's and '90's.

Nevertheless, whatever happens in the future the low fertility of the '70's is going to have an impact on the educational system and on the whole society for many decades to come. The total number of children born in the '70's may very well be only 70 percent of the total number born in the '60's. As these cohorts pass up into elementary school, into high school and colleges, and into later life, there will be an ineradicable deficiency of people of age **x** *in the years 1970 plus* **x**. *We are already beginning to experience this in the educational system. The grade schools are already beginning to empty;*

in three or four years the high schools will be emptying, and in eight years the colleges. No matter what happens to fertility in the future the pattern of the educational system for the next twenty years or more is set by the low fertility of today. If the low fertility continues, the effects will be accentuated by the year 2000. In the '70's the low fertility of those of childbearing age is to some extent offset by the large numbers of people in childbearing age resulting from the high fertility of the '50's. If low fertility continues into the '90's, we will have a small generation of childbearing age with low fertility and the number of children born may shrink even more dramatically than it has done in the last fifteen years. Future fertility, however, is always a great mystery and it would be extremely unwise to project it very far.

The whole problem of adjustments to decline is something which has received little attention on the part of social scientists of any discipline. There is a good reason for this neglect, for the past decline has not been a very large problem—though sometimes serious where it occurs—and has been confined to relatively small parts of society. Furthermore, in a society which is generally advancing, the problem of decline, even in those areas where it occurs, is often not very serious because it is easy for people to get out of declining occupations and areas and into advancing ones. We see this particularly in an occupation like mining where the existence of a large number of ghost towns suggests that once a mine is exhausted the people simply leave and find other occupations or other mines to work in.

The case of agriculture is perhaps the most serious. Here we do encounter something which can almost be described as a pathology of decline. In the United States agriculture has declined from something like 70 to 80 percent of the labor force to under 5 percent between 1783 and 1974. This has been almost entirely the result of a rather steady increase in labor productivity in agriculture, so that whereas 200 years ago it took about three fourths or four fifths of the people to grow enough food for everybody, nowadays we can grow enough food for everybody with less than 5 percent of the labor force. This decline has been so long and so persistent that it has resulted in a very long-term disadvantage for agriculture, and for many decades agricultural incomes were only about half of corresponding incomes in industry. The principle reason for this is that the exit from agriculture has never been fast enough to offset the effects of its increasing productivity. Getting people out of a particular occupation is a little bit like getting toothpaste out of a tube—it has to be squeezed in order to get people out of it, and there has to be an income

differential of noticeable dimensions between the declining occupations and the expanding occupations, otherwise people will not move out of the declining and into the expanding occupations. In the case of agriculture this differential has been far greater than was strictly necessary simply because of the very long continuance of the movement of relative decline.

Agricultural decline has created all sorts of agricultural policies, many of which have been somewhat destructive in their effects, where they have not been, often fortunately, ineffective. In spite of all agricultural policies, however, the relative decline of agriculture has continued and in the last generation, for instance, we have moved some 30 million people out of agriculture mainly into urban life. This, indeed, is the main source of our present urban problem and it suggests that however clumsily we may have made the transition, probably at a higher human cost than was necessary, the transition was in fact made.

In a society, however, in which population and per capita income are either stationary or rising very slowly the problems of adjustment to decline may be more acute. In an advancing society people are almost sucked out of a declining industry by the jobs created by the expanding ones. If there is little expansion in other parts of the society, then the transfer out of the declining industries may be difficult and adjustment to decline becomes a much more serious social problem. I am not suggesting that we are facing these problems immediately. I do not expect a stationary population in the United States for many decades and I do not expect stationary real incomes for perhaps an even longer period. I do, however, expect a considerable slowdown in the rate of expansion of population and in the rate of increase of real income. This will affect one segment of society after another, so that the sooner we begin thinking about these problems of adjustment to decline the better prepared we will be for what lies ahead. Education, as I suggested, will be the first major segment of the society to be affected by decline and we are already well into this period. Dr. Rodekohr's study, therefore, is particularly welcome. It is a pioneering study and one hopes that it is the beginning of a substantial interest in this field.

Dr. Rodekohr's study is deliberately limited in scope, partly because resources were not available for a larger study, but also because we felt that a pioneering study on a scale small enough to be intensive would be much more valuable than a diffuse study of the whole country. For this reason Colorado

was selected as the field of study, in the hope that methods could be worked out and hypotheses suggested which could then be applied at a later date to the whole country. The strategy, I think, was well justified. Dr. Rodekohr is particularly to be congratulated on his method. He starts off with the larger statistical picture in order to identify those school districts in which enrollment has in fact been declining and to identify their statistical characteristics. He follows this up with a questionnaire to school superintendents to get data at a more intensive level, and he follows this up in turn with a case study by interviews in five districts which represent the most important categories that emerge after the preceding analysis. One hopes that his method, indeed, will set a pattern for future studies of this kind. Purely statistical studies lose greatly the richness of detail which is possible in more intensive studies, and yet case studies frequently lose significance because they are not placed in the larger statistical setting out of which they are drawn. Dr. Rodekohr has combined both methods with skill and insight. As a result his study has an interest and validity which extends far beyond the limited geographical area from which it was drawn. One could apply this method, indeed, not merely to school districts but to large variety of social institutions in studying adaptation to decline – to businesses, churches, local governments, military establishments, and so on down the whole roster of social institutions. One might visualize almost a sub-discipline of "decline studies" emerging in the next generation out of this pioneering work.

Even in the limited field of this study some extremely interesting hypotheses and questions for further study are suggested. One of these concerns the divergence between the image of the situation in regard to decline as it is held by important decision-makers in the system, and the realities of the situation as revealed by statistics. In a significant number of cases Dr. Rodekohr discovered that school superintendents who were in districts which had suffered declining enrollments were either unaware of the fact or had suppressed the information in their own minds. This may be a very general phenomenon. It is a well-known psychological principle that there is a tendency to suppress images of the world which are disagreeable to us, and if our whole society is growth oriented and if our skills are in the handling of growth, it will not be surprising if the very image of decline is rejected even when the objective data suggests that decline has in fact taken place.

This problem may also be related to what might be called the problem of "institutional memory." The school superintendent, for instance, who

has not been at his present job for very long may simply not be aware of what things were like even ten years ago. Though records might be available the sheer pressure of current problems or current events prevents many people from examining them, so that it is quite possible for a decision-maker to be in a situation where he or she is quite ignorant about the history of the institution on behalf of which decisions are being made. Even when there is long tenure in a particular office the human memory is highly selective, sometimes records themselves are lost, and so on. This whole problem of institutional memory, that is, the image of the past which is present in the minds of current administrators and decision-makers, is a problem which is worthy of much further investigation in all fields of social life. Decisions have to be made according to some image of the future. Our image of the future depends in a very large measure on our image of the past, which is indeed the only place we can get it from, and if our image of the past is defective, our image of the future may also be defective and our decisions will be defective likewise. We will be making decisions among imaginary and unrealistic alternatives, and under these circumstances it will be mainly a matter of luck whether they turn out well.

The general applicability of Dr. Rodekohr's study is perhaps diminished somewhat by the fact that most of his declining districts were rural, so much so, indeed, that it was not possible statistically to eliminate the rurality variables in investigating the relationships. There was, however, an opportunity to do an interesting case study on a nonrural declining area, but some of the statistical conclusions, such as that the declining districts stood higher on a number of indicators of quality than the growing districts, may be due as much to the predominantly rural character of the declining district as to the fact of their decline. It would take a much larger study over a wider area, which could gather data on nonrural declining districts, to clarify this point.

The Colorado data does suggest one conclusion which is no less important because it is not wholly surprising: that large districts adjust to decline better than small ones, perhaps simply because when there are more things and people to rearrange, it is easier to rearrange them. It would be extremely interesting to study the decision-making units of other declining sectors of the economy to see if this principle held generally. If it does, the implications may be a little ominous that under conditions of decline it is the small unit that is most likely to go under. Thus, fast decline will almost inevitably be

accompanied by concentration of the declining sector into decision-making units of larger size. I would certainly not be surprised to see this happening in the colleges and universities. Small institutions may be much more vulnerable in a period of decline than the large ones, so that we will end up with a smaller variety of size and perhaps character of institutions.

There is perhaps a parallel here to the biological principles of declining populations. Declining populations are apt to suffer gene loss which may make them still more vulnerable to further decline, so that beyond a certain point decline almost always goes to extinction. If this principle were to operate very strongly in social systems, it might lead to the depressing conclusion that the stationary state cannot be stable and that it will inevitably lead to cumulative social disorganization, even to the point of extinction. I am not saying, of course, in any sense that this conclusion is necessary. However, this mere possibility underlies the great importance of discovering the skills of adjustment to decline which would prevent this cumulative worsening. Fortunately, there is a good deal of evidence in Dr. Rodekohr's study that declining enrollments can be used as an opportunity for increasing the quality of education and that up to a point decline can be very healthy. Depending on prevailing attitudes in the community, decline can be regarded either as an opportunity for improvement, at least in some regards, or as an inevitable source of impoverishment in programs and variety.

Coming out of the kind of work of which this study is hopefully a beginning, one can visualize important changes in the training of administrators of all kinds. It may take us some time to get to the point where schools of education, schools of business, and schools of public administration will routinely offer courses in the "management of decline." If and when this happens—and I would not be surprised to see it happen within the next generation—the pioneering work of Dr. Rodekohr may well be one of the first items on the bibliography.

By Kenneth E. Boulding

American Fertility

Fertility patterns in the United States have varied widely over the last century. There have been two major turning points in fertility behavior in the

United States since World War II. The first of these may be observed by examining the births per 1,000 women aged 15 to 44. These rates are presented in Figure 1. This data shows that after World War II fertility started to increase from 89 births per 1,000 women aged 15 to 44 in 1944, to a high of 123 in 1957. After 1957 the fertility rate dropped almost steadily until 1970 when the rate was about 88. This represents the phenomenon commonly referred to as the "baby boom" in the '50's which was widely held to be the cause of so many serious problems of adjustment in the education industry in the United States.

The combination of this historical trend of decline in American fertility with very recent fertility behavior points to a totally different problem for education in this country. The most recent data show that fertility has declined from 88 in 1970 to a seasonally adjusted rate of 68.1 in July of 1973.[1] This is below the "replacement rate," which is the level that if continued throughout a couple's reproductive lives, is consistent with population replacement and could lead eventually to a stabilized population.[2] This represents an unprecedented decline in American fertility. The problems of growth that were experienced in the late '50's and early '60's may be small in comparison to the problems associated with decline which are already occurring.

The Problem

The above situation clearly defines the problem of this study. The drop in fertility has caused a loss in national school enrollment in the lower grades. Figure 2 shows this loss in elementary school enrollment that has occurred since 1967. In fact, certain projections of the population show that this trend will continue at least until 1980 and even cause a drop in total enrollment (K-12) during the present decade.[3]

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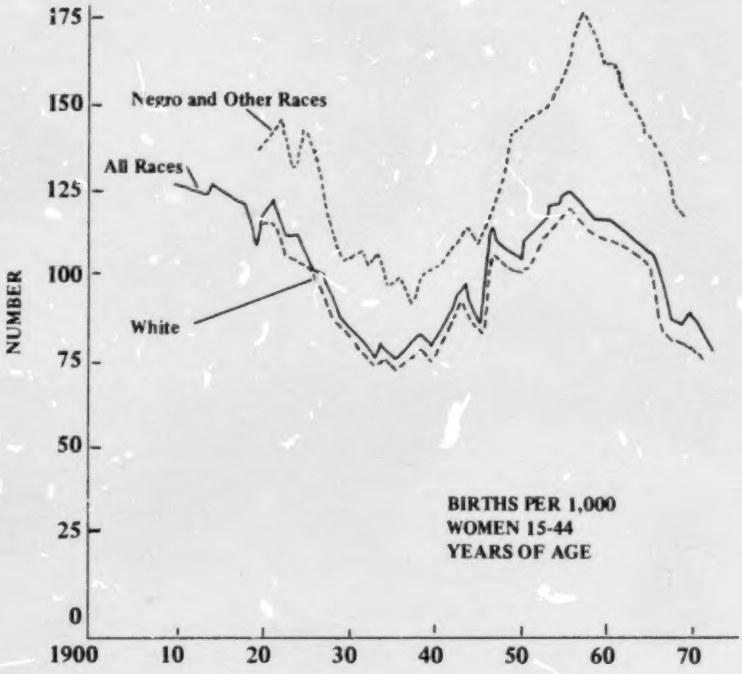
[1] U.S. Public Health Service, *Monthly Vital Statistics Report*, XXII, 7 (September, 1973), p. 1.

[2] "Nearing Replacement," *Family Planning Digest*, I, 6 (November, 1972), p. 5.

[3] *Projections of Educational Statistics to 1980-81*, National Center for Educational Statistics, Office of Education, U.S. Department of Health, Education, and Welfare (Washington, D.C.: U.S. Government Printing Office, 1971), p. 22.

Figure 1

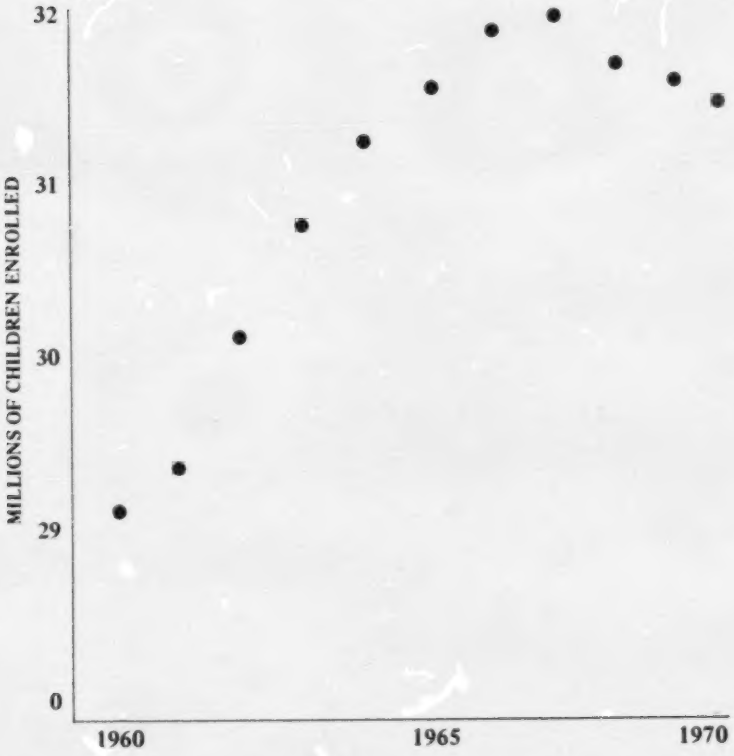
FERTILITY RATE
U.S.A., 1909-1972
By Race[4]



[4]Executive Office of the President, *Social Indicators 1973* (Washington, D.C.: U.S. Government Printing Office, 1973).

Figure 2

NUMBERS OF CHILDREN ENROLLED
IN ELEMENTARY SCHOOL IN THE UNITED STATES
1960 TO 1970[5]



[5] *Ibid.*, taken from Table 4, p. 22.

This would seem to constitute a near crisis in the American educational system. All of the institutions and thought embodied in American education are accustomed to long periods of growth. Since decline is replacing growth, the education industry of this country must reshape its institutions so that they may now deal with a system that will decline, and do this in an efficient manner. The effects of this decline on the current American educational system is the topic of this study.

This study compares patterns of resource allocation, and changes in this pattern, in school districts with different enrollment experiences, ranging from substantial growth to substantial decline. In general the study focuses on examining the "parameters of adjustment" of public school systems with varying growth histories.[6] That is, which variables are perceived as adjustable, which of the adjustable set is selected in response to decline, and how changes in these variables relate to decline itself.

The State of Colorado is selected because some of its characteristics made it an ideal region for the implementation of this study. The public school districts within the state offer a wide variety of growth histories. For example, out of the 181 school districts in the state, 73 experienced decline (as measured in terms of the percent changes in average daily attendance (ADA) from the 1961-62 school year to the 1969-70 school year) and the remaining 108 had varying degrees of positive growth.[7]

The study examines a number of hypotheses with respect to the allocation of resources in systems with different growth histories. Some of the major hypotheses to be considered are: (1) the pattern of resource allocation is significantly different among the growing and declining enrollment systems, (2) levels of student achievement differ among school systems encountering different growth rates, (3) the level and structure of the staff has a tendency to stabilize in the negative growth systems, and (4) the rate of

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[6] *Ibid.*, p. 5.

[7] *Consolidated Report on Elementary and Secondary Education* (Denver, Colorado: Colorado Department of Education, 1971).

innovation is retarded in the systems encountering stable or negative enrollments.[8]

In order to study the problem areas associated with decline the remainder of the study is organized into three major sections. The first describes the data that were collected and performs a preliminary analysis. This analysis is based on certain hypotheses that will be stated later. The second section formulates and analyzes a questionnaire that is used to test the responses of administrators to decline. The last section utilizes a case study approach to further analyze the effects of decline on the local school district.

Data and Preliminary Analysis

In order to test the hypothesis that decline leads to different resource allocation patterns than growth, data were collected pertaining to three different areas. The first is staff related characteristics. The second is financial characteristics that relate to the financial structure of each district. The last is community characteristics which relate to the socioeconomic status of the community. Also two variables, dropout rates and achievement scores, were collected as alternative measures of output.

The initial analysis consisted of computing the means of these variables and testing for statistically significant differences between these means. This gave an indication of patterns of adjustment caused by decline that may lead to differences in the financial and staff characteristics of the growing and declining districts. A correlation analysis was then completed to indicate the important interrelationships among the variables. This also helped to give an indication of the method of adjustment to decline. The next step consisted of using discriminate analysis which isolates the variables which account for structural differences in the two growth systems. This information is used to create a profile of a typical growing and a typical declining district.

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[8]Nicholas Schrock and Larry Singell, *A Proposal for the Study of the Impact of Declining Enrollments on the Allocation of Resources in American Education* (unpublished grant proposal, University of Colorado, 1973), pp. 1-3.

A. Description of the Data

The variables described in this section represent some of the relevant characteristics of a school district. Tables 3 through 6 give a description of these variables.

Table 3 describes the financial characteristics of the State of Colorado school districts. This table indicates that total expenditures, mill levy, local and county revenue per ADA, state revenue per ADA, total revenue per ADA, current expenditures per ADA, and the pupil-teacher ratio are all statistically different in the growing and declining districts. The growing districts on the average levy about five more mills than the declining districts. The growing districts also spend about $200 less per student than the declining districts. The pupil-teacher ratio is very different in that the declining districts have about three less students per teacher than the growing districts. The federal revenue per ADA, and the average salary difference between teachers and administrators is not significantly different.

This is valuable information because it shows that there are many important differences in the growing and declining districts. The higher mill levy and lower local and county revenue per ADA in the growing districts represents the fact that these districts have a smaller assessed value per ADA and use a higher mill levy and still produce less revenue.[9] The declining districts have both higher total revenues and current expenses per ADA than the growing districts. This may reflect higher costs due to two factors: the smaller size of the negative districts, and their decline. The smaller size may indicate that the declining districts are operating at a below optimum size and because of this they cannot achieve economies to scale. The difference between total revenues and current expenditures is also important because it approximates the capital cost per year per ADA. This difference for the declining districts was $200, while for the growing districts it was $164.

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[9]This difference in taxation is even greater than it first appears because the assessment ratio (assessed value/market value) in the counties which experienced decline is approximately 10 percent less than the ratio for counties which experienced growth. The data necessary for this calculation can be found in Department of Local Affairs, Sales Ratio Study, 1971 (Denver, Colorado: Division of Property Taxation, State of Colorado, 1971), all pages.

Table 3 [10]

FINANCIAL CHARACTERISTICS OF THE STATE OF COLORADO SCHOOL DISTRICTS

Significance Level	Variable Number	Mean	Declining Mean	Growing Mean	Variable Name	Definition
.005	1	2,448,580	545,029	3,735,224	Total Expenditures	All charges incurred for all funds including capital outlay and debt service
.0005	2	46.4	42.8	48.7	Total Mill Levy	The tax rate for the school district
.005	3	722.2	843.1	640.4	Local and County Revenue/ ADA	District and county revenue used for schooling purposes, divided by pupils in ADA
.005	4	274.5	300.5	257.0	State Revenue/ ADA	Funds received by the district from the state divided by pupils in ADA
N	5	48.3	47.1	49.5	Federal Revenue/ ADA	Funds received by the district from the federal sources divided by pupils in ADA

Table 3 (Continued)

.005	6	1045.1	1191.0	946.5	Total Revenue/ ADA	The sum of the above three variables
.0005	7	866.6	991.3	782.4	Current Expenses/ ADA	The sum of all expenses of the general fund except community services, capital outlay, and debt service, plus fixed charges of all other funds and replacement of equipment in the capital reserve divided by pupils in ADA
.0005	8	18.7	16.8	19.9	Pupil-Teacher Ratio	The number of pupils in fall membership divided by the full-time equivalency of classroom teachers
N	9	-365.7	-366.7	-365.1	Teacher/ Administrative Salary Difference	This was calculated by subtracting the average salary of classroom teachers from the average salary of the professional staff

[10]Colorado Department of Education, *Consolidated Report on Elementary and Secondary Education in Colorado,* Denver, Colorado, 1970, pp. 1-286. The declining mean refers to the mean value of the 73 districts that experienced negative rates of growth, while the growing mean refers to 108 districts that experienced positive rates of growth in terms of the percent change in ADA's from the 1961-62 school year to the 1969-70 school year. The significance level refers to the level at which the positive and negative means are statistically different. The letter "N" refers to no statistical difference.

Table 4 shows the staff characteristics for the districts. The average teacher salary, average professional salary, and percent staff with an MA are all significantly different in the growing and declining districts. The average teacher and professional salary in the growing districts is about $500 greater than in the declining districts. The administrative and classroom teacher turnover rates are not statistically different. The difference between average teacher and administrative salaries for the two sets of districts occurs because of the prevalence of higher educational attainment of teachers in the positive growth districts. The larger size of the growing districts also accounts for some of this difference. In general the larger districts have a better organized staff which may be more effective in negotiating for higher salaries.

The variables related to community characteristics are given in Table 5. The community variables reflect the social and economic status of the different districts. This status is fundamental in the determination of certain educational attributes of the community. The size of the declining districts as measured by any of four different variables (total population, total rural population, total white population and total black population) is significantly smaller than the growing districts. In terms of total population, declining areas have an average of about 16,000 fewer persons per district than growing areas. Wealth variables such as owner and rental housing index, adjusted income per student, and poverty level all show that the declining areas are significantly less wealthy than the growing areas. In fact declining districts produce an average income per student that is $1,000 less than the growing districts. However, the assessed value per student shows the opposite, that the declining districts have more wealth. A likely explanation for this difference is that the predominance of farm income in declining areas is subject to a high savings ratio which makes reported income lower than could otherwise be expected. There is no significant difference in the percent of the population that is black.

The declining districts are significantly more rural, smaller in terms of students, and less dense in terms of numbers of students per school than the growing districts. Almost 20 percent more of the residents are classified as rural in declining areas as compared to growing areas. The pattern of population growth in Colorado shows that most of the growth has occurred in suburban areas along the front range which extends from Fort Collins to Pueblo, and in certain recreational areas in the mountains.

Table 4[11]

STAFF CHARACTERISTICS OF THE STATE OF COLORADO SCHOOL DISTRICTS

Significance Level	*Variable Number*	*Mean*	*Declining Mean*	*Growing Mean*	*Variable Name*	*Definition*
.0005	10	7452.4	7117.4	7678.8	Average Classroom Teacher Salary	The total annual salary of the district's certificated teaching staff, divided by the FTE of the staff
N	11	17.2	18.4	16.5	Administrative Turnover Rate	The rate (percent) at which personnel classified as administrators leave or separate from the district
N	12	23.1	24.6	22.0	Classroom Teacher Turnover Rate	The rate (percent) at which personnel classified as teachers leave or separate from the district
.0005	13	7818.1	7484.1	8043.9	Average Professional Staff Salary	The total annual salary of the district's certificated staff, divided by the FTE of the staff

0.1	14	25.7	24.1	26.9	Percent Certificated Staff with MA or beyond	This includes the MA, MA plus honors, educational specialist or doctorates

[11]Colorado Department of Education, *Consolidated Report on Elementary and Secondary Education in Colorado,* Denver, Colorado, 1970, all pages. The declining mean refers to the mean value of the 73 districts that experienced negative rates of growth, while the growing mean refers to 108 districts that experienced positive rates of growth in terms of the percent change in ADA's from the 1961-62 school year to the 1969-70 school year. The significance level refers to the level at which the positive and negative means are statistically different. The letter "N" refers to no statistical difference.

Table 5[12]

COMMUNITY CHARACTERISTICS OF THE STATE OF COLORADO SCHOOL DISTRICTS

Significance Level	*Variable Number*	*Mean*	*Declining Mean*	*Growing Mean*	*Variable Name*	*Definition*
.0005	15	14.0	-16.2	34.4	Percent Change in ADA	The percent change in ADA from the 1961-62 school year to the 1969-70 school year
.005	16	12176.3	2499.6	18717.0	Total Population	The total population of the school district
.0005	17	2730.6	1411.0	3622.5	Rural Population	Total rural population of the school district
.005	18	11651.4	2460.6	17863.8	White Population	Total white population of the school district
0.1	19	368.9	27.4	599.9	Black Population	Total black population of the school district
.025	20	2.8	1.8	3.5	Owner Index	An index of the value of owner occupied housing in the school district. The following is an explanation of the index:

Index No.	Value
1	Less than $5,000
2	$5,000 to $9,999
3	$10,000 to $14,999

						4 $15,000 to $19,999 5 $20,000 to $24,999 6 $25,000 to $34,999 7 $35,000 to $49,999 8 Over $50,000
.0005	21	2.6	1.9	3.1	Rental Index	An index of the rent paid for all rental housing in the school district. The following is an explanation of the index: Index No. Value 1 Less than $40 2 $40 to $59 3 $60 to $79 4 $80 to $99 5 $100 to $119 6 $120 to $149 7 $150 to $199 8 $200 to $299 9 Over $300
.0005	22	3717.3	879.4	5688.2	Population Under 18	Total Population that is under 18 years of age
.01	23	6129.2	5693.2	6545.1	Adjusted Income Per Student	The 1969 gross income which includes all income minus certain expenses such as business and travel expenses, loss from sale, etc. For further information write Kern Alexander, National Educational Finance Project, 1212 S.W. 5th Ave., Gainesville, Florida

Table 5 (Continued)

N	24	3.7	3.5	3.75	Percent Black	Derived by dividing the total population (16) into the total black population (19).
.0005	25	79.7	90.5	72.3	Percent Rural	Derived by dividing the total population (16) into the total rural population (17)
.0005	26	333.0	215.7	412.2	Density	Derived by dividing the population under 18 years of age by the number of schools in the district
N	27	2.6	2.3	3.2	No. of Schools	Total number of schools in the district
.005	28	2900.8	654.5	4419.1	Fall Membership	Total enrollment in the district that is gathered in the early fall
.0005	29	13.7	-3.6	25.5	Percent Change in Population	The percent change in the total population from 1960 to 1970. This is an average of the county subdivisions that comprise each county.
.0005	30	13.3	16.1	11.4	Poverty Level	The percentage of families that had an income less than the poverty level as defined by the census
.0005	31	11.8	11.2	12.2	Median School Years	The median school years completed by the population

0.1	32	36.5	36.1	36.7	Under 18	The percentage of the population under 18 years of age
.0005	33	10.1	11.4	9.2	Over 65	The percent of the population that is over 65 years of age
.0005	34	3331.0	3464.3	3241.0	Fertility	The cumulative fertility rate or the number of children ever born per 1,000 women between the ages of 35 and 44
N	35	4.0	3.8	4.1	Unemployment	The percent of persons actively seeking work who were currently unemployed
.0005	36	2764.5	610.9	4220.2	ADA	Average daily attendance
.005	37	17308.8	22526.3	13782.2	Assessed Value/ ADA	The assessed valuation of the district certified by the Colorado Tax Commission divided by the ADA of the district

[12]Variables numbered 15, 27, 28, 36 and 37 come from *Consolidated Report on Elementary and Secondary Education in Colorado*, Colorado Department of Education, Denver, Colorado, 1970, all pages. Variables numbered 16 through 22 inclusive come from *First Count and Reference School District Microfilm for Colorado*, U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census, Washington, D.C. 20233. Variables numbered 29 through 35 inclusive come from *General Social and Economic Characteristics of Colorado*, U.S. Department of Commerce, Bureau of the Census, Washington, D.C. 20233. Many of these variables were obtained from a special school district census that was done by the U.S. Census Bureau which only contained direct information on 111 of the 181 total districts. The characteristics of the missing districts were contained in the census but had to be allocated on the basis of the fall enrollment of each missing district. The variables that were obtained for counties come from the published State of Colorado census performed by the U.S. Census Bureau and were allocated to districts in a similar manner. Spanish surname population is the predominant minority in Colorado; unfortunately only data for counties with over 400 Spanish surname persons was available. Therefore, this minority population was not included in this study. The declining mean refers to the mean value of the 73 districts that experienced negative rates of growth, while the growing mean refers to 108 districts that experienced positive rates of growth in terms of the percent change in ADA's from the 1961-62 school year to the 1969-70 school year. The significance level refers to the level at which the positive and negative means are statistically different. The letter "N" refers to no statistical difference.

The median school years completed by the population in the declining districts is significantly less than in the growing districts. The difference in the percent of the population under 18 and over 65 in the growing and declining areas is easily accounted for by the demographic changes that have occurred. The difference in the cumulative fertility rate is at first surprising because the negative growth districts have a higher fertility rate on the average. However, this trend represents the process of plurality. This concept was first developed with regard to the southern United States, and it refers to the situation where the population remaining in declining areas has a higher birth and mortality rate than the out-migrating population.[13] There was no major difference in the unemployment rates for the two types of districts.

The values of two common measures of output, dropout rates and achievement scores, are summarized in Table 6. The results of this table are interesting because they show that the declining districts have significantly lower dropout rates and higher achievement scores than the positive growth districts. The lower dropout rates may reflect the rural nature of the declining areas. In the more rural setting the opportunity cost of remaining in school may be very low when compared to urban areas because of the lack of available employment in the rural areas.

B. Correlation Analysis

In order to further assess the effects of decline a correlation analysis of the variables previously presented was performed. This correlation analysis provided some useful results by pointing out some critical interrelationships between decline and the other staff, financial, and community-related variables. A summary of the more interesting correlations is presented in Table 7.

The growth variable, the percent change in ADA from the 1961-62 school year to the 1969-70 school year, is significantly related to many of the

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[13] A. Nash (ed.), "Population Change and State Government Policy," *Governance and Population: The Governmental Implications of Population Change*, The Commission on Population Growth and the American Future, Research Reports Vol. 2 (Washington, D.C.: U.S. Government Printing Office, 1970), p. 130.

Table 6[14]

OUTPUT CHARACTERISTICS OF STATE OF COLORADO SCHOOL DISTRICTS

Significance Level	*Variable Number*	*Mean*	*Declining Mean*	*Growing Mean*	*Variable Name*	*Definition*
.01	38	6.0	4.1	7.7	Dropout Rate	The projected dropout rate or the expected percentage of 7th grade students who will not graduate from high school with their class if conditions remain the same
.005	39	0.009	0.18	-0.106	Achievement Scores	The standardized achievement scores of sixth graders

[14]The dropout rates and achievement scores are from Colorado Department of Education, *Consolidated Report on Elementary and Secondary Education in Colorado,* Denver, Colorado, 1971. However, the achievement scores could not be obtained as a singular index; they were given primarily as fourth and sixth grade reading or math scores in terms of grades above or behind the grade level at which the test was taken. They were converted to a sixth grade score for each district because the effects of decline should have occurred by then. The declining mean refers to the mean value of the 73 districts that experiences negative rates of growth, while the growing mean refers to 108 districts that experienced positive rates of growth in terms of the percent change in ADA's from the 1961-62 school year to the 1969-70 school year. The significance level refers to the level at which the positive and negative means are statistically different.

Table 7

SUMMARY OF CORRELATION RESULTS

Percent Change in ADA is correlated with	*Correlation*
(2) Mill Levy	.3718
(3) Local and County Revenue per ADA	-.3186
(4) State Revenue per ADA	-.2805
(6) Total Revenue per ADA	-.3299
(7) Current Expenditures per ADA	-.4300
(8) Pupil-Teacher Ratio	-.4202
(10) Average Teacher Salary	.386
(13) Average Professional Salary	.3882
(20) Owner Occupied Housing Index	.2503
(21) Rental Housing Index	.6119
(25) Percent of Population that is Rural	-.3736
(26) Density	.5445
(30) Poverty Level	-.3820
(31) Median School Years Completed	.2738
(34) Fertility Rate	-.2968
(37) Assessed Value per ADA	-.2865

Critical r = .202 (approximate at .05 level)

financial variables. The relation of the percent change in ADA to the mill levy, local and county revenues per ADA, state revenues per ADA, total revenues per ADA, current expenditures per ADA, and the pupil-teacher ratio indicates that there may be fundamental differences in the patterns of resource allocation between growing and declining school systems. This conclusion is further strengthened by the significant correlation between the percent change in ADA and the average teacher and professional staff salary. Combining this information with that given in part A of this section yields a possible adjustment pattern. In adjusting to decline the district's fixed cost per student is increased. The declining district also seems unwilling to keep its class size constant during decline which lowers the pupil-teacher ratio. The combination of these two effects along with the loss of other economies to scale increases the total cost per student. The larger amount of resources devoted to students which is largely characterized by the lower pupil-teacher ratio may have a positive effect on achievement scores and dropout rates.

Another interesting correlation is between the growth variable, the percent change in ADA, and the set of wealth-related variables which includes the owner occupied house index, the rental housing index, poverty level, and assessed value per ADA. This could occur because the decline in economic viability relates to the decline in wealth and population. Another possibility is that these areas could have always been low income agricultural communities that have just lost population.

The correlation of the percent rural and decline probably occurs because of the disappearance of the family farm in the rural areas. The correlation of the median school years completed to the growth variable is expected because the more highly educated population would tend to migrate toward economic areas that were growing because of a better job market for their skills. The relationship of the fertility rate and population growth or decline was discussed previously in this section. The positive correlation between the density variable (the number of students per school) and the percent change in ADA indicates the positive relation between size and growth. The next part uses discriminate analysis to isolate structural differences between growing and declining systems.

C. Discriminate Analysis

In order to test the hypothesis that there are structural differences in

the two systems a stepwise discriminate analysis was performed over the entire set of data, excluding the percent change in ADA variable and the change in total population variable. The data was stratified into two groups; one being districts with a negative rate of growth and the other being districts with a positive rate of growth. The hypothesis advanced is that a fundamental structural difference exists.

Discriminate analysis is used to construct a rule from the sample observations of the two populations which will enable the assignment of a new observation to one of the populations.[15] The results of this analysis are presented in Table 8.

These results suggest that the declining and growing districts do not exhibit random behavior in the variables that characterize them. The variables that were significant in discriminating between the two groups represent a variety of factors. The rental housing index and poverty level both represent a wealth factor which explains some of the structural differences between the two systems. The significant current expenditures per ADA variable indicates that the total resources a community devotes to education is affected by growth or decline. The median school years completed represents a taste for education factor that is also critical in explaining the structural differences. The percent of teachers with an MA indicates that the quality of staff is an important variable for explaining differences between growing and declining districts. Achievement scores, to some extent, represent the output of the local district. Since the output variable can be used to classify a new district into one of the subpopulations they indicate that there is a significant difference in the output of the two systems.

In conclusion, wealth, quality of staff, total resources, taste for education, and output can be used to distinguish between a typical growing and a typical declining district. Since these factors distinguish between the two systems they point out some of the structural differences that exist in the two systems and therefore give an indication of the effects of growth or decline on resource allocation. This also indicates that decline or growth has

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[15] J. Johnston, *Econometric Methods* (New York: McGraw-Hill, Inc., 1972), p. 334.

Table 8[16]

SUMMARY OF RESULTS OF DISCRIMINATE ANALYSIS

Variable Number	*Variable*	*Function*		*F Statistic*
		Declining	*Growing*	
(21) (7)	Current Expenditures Per ADA	.0174	.0151	10.66
(14)	Percent Teachers with an MA	.125	.091	3.49
(21)	Rental Housing Index	1.69	2.32	35.14
(30)	Poverty Level	1.07	.974	10.02
(31)	Median School Years Completed	7.25	7.69	17.84
(39)	Achievement Scores	-1.68	-2.30	4.20

Critical F = 2.73 (approximate at .01 level)

	Number of Cases Classified into Group	
	Declining	*Growing*
Declining	57	16
Growing	18	90

[16]The discriminate function when multiplied by the corresponding variables of the new observation yield a discriminate score which can be used to classify the new observation as growing or declining.

some effect on the quality of education provided. In fact the decline or growth also has an effect on the taste for education in the community and quality of staff that is provided for the education of the youth of the community.

This preliminary data analysis has been used to create a profile of the typical growing and the typical declining district in the next part.

D. Conclusion

The typical declining district is characterized by many attributes that are very different from the typical growing district. A declining district is characterized by a relatively low mill levy which, when combined with the relatively higher assessed value per ADA, produces higher revenues. The declining district has a relatively lower pupil-teacher ratio and relatively higher capital costs per pupil which are the main reasons for the higher costs per ADA. In terms of income and other indications of wealth, such as the value of owner occupied and rental housing, the declining areas are comparatively less wealthy than the growing areas. The staff of the typical declining district is not as well educated as the staff of the typical growing areas. The typical declining area is more rural, smaller, and has a lower educational attainment than the growing area. The rural nature of declining districts tends to bias at least one of the output measures, the dropout rates, because of the smaller opportunity cost of remaining in school. The fact that the declining areas are in general much smaller than growing areas may lead to the loss of economies to scale that have an important impact on costs.

In terms of output, the declining area has lower dropout rates and higher achievement scores than the growing areas. Indeed, achievement scores are an important enough variable so that they may be used to distinguish between growing and declining districts.

The typical growing district has a higher mill levy which when combined with the lower assessed value per ADA still produces less revenue/APA than the declining district. The higher pupil-teacher ratio and higher teacher salaries produce less expenditures per ADA in the growing district because the pupil-teacher ratio is very critical in determining total expenditures. The growing district is typically more wealthy in terms of income, though not in assessed valuation, less rural, and larger than the declining districts.

The significant correlations between growth or decline and the many financial and staff related variables further strengthens the argument that growth or decline produces significant differences in the resource allocation patterns of the two growth systems. The fact that expenditures, the percent of teachers with an MA, and achievement scores can be used to distinguish between growing and declining areas adds more evidence that resource allocation is very different and that this allocation pattern leads to differences in the output or even in the quality of education provided by growing or declining school districts.

Based on this information, a tentative conclusion can be reached that decline causes a change in resource allocation patterns. Decline raises fixed costs and lowers the pupil-teacher ratio. Even with relatively lower salaries being paid to teachers in declining areas, the lower pupil-teacher ratio has a great impact on costs per student. When the loss of economies to scale are also taken into account with the lower pupil-teacher ratio, the cost per student for education in declining areas is far higher than in growing areas. This affects the output of the schools in the declining areas by lowering dropout rates and increasing achievement scores. However, as has been previously mentioned, the predominate rural nature of these areas makes this only a tentative conclusion.

An Empirical Analysis of Decline: Results From the Questionnaire

In order to analyze the nature and variance of responses of school districts to declines in their enrollments, a questionnaire was formulated and administered to individuals who acted in some decision-making capacity in the school districts which experienced decline. The purpose of this section is to discuss the formulation, implementation, and results of this questionnaire. The section is organized into three major parts. These are the purposes of the questionnaire, summary and analysis of the results, and a conclusion in which the results are discussed in light of the hypotheses that were formulated earlier in the study.

A. Purpose of the Questionnaire

In general the questionnaire was designed to accomplish two main purposes. The first purpose was to isolate the major problem associated with decline as perceived by school administrators. The data that have already

been presented show some of the overall resource allocation differences, but do not give a feeling as to what the districts perceive as their major problems associated with declining enrollments. Second, the information from this questionnaire was used as a prime input for choosing districts where more intensive interviews would be administered. The findings from these interviews will be elaborated upon in the next section.

In terms of the larger objectives of the study, this evaluation helped to expand the empirical foundation on which the study was based and perhaps even more important, the open ended questions gave a feeling for what was foremost on the minds of the school district representatives with regard to the problems of decline. This input thus provides some insight into the more specific problems the districts face.

A questionnaire was mailed to the superintendents of the 73 school districts which had declining enrollments in terms of the percent change in ADA's from the 1061-62 school year to the 1969-70 school year. These individuals would be expected to have an overall knowledge of the workings of their districts and would also have a knowledge of the specific and general problems that face their schools and communities.

B. Summary of Results

Two major difficulties require that the results of the questionnaire be interpreted with caution. First, even though the superintendents were asked to think in terms of the years from 1961 to 1970 it is natural for them to think in terms of problems that currently confront them. This could be a problem since some of the districts have experienced increased enrollments since 1970 and their current problems may be different from the past problems. Secondly, some of the superintendents were not present during the time period in question and thus questions were completed by someone who was not in an administrative or decision-making capacity. While all of the responding districts faced decline, there may have been a significant time lag between the decline in enrollment and the reallocation of resources in response to this decline. Hence, these problems must be kept in mind when the results are analyzed.

A basic statistical analysis was performed on the questionnaires that were returned. The use of a follow-up letter produced a total return of 65

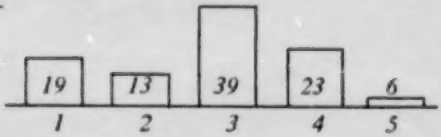
percent. The analysis consisted of first calculating the primary moments of the distributions of the responses, such as the mean, median, mode, standard deviation, skewness, and kurtosis. The following results were obtained. The number enclosed in parentheses is the number of the response corresponding to the relative frequency in the bar graph below. The number inside the bar graph is the percent frequency of each response.[17]

This analysis showed that the median years the superintendents were employed in their present district was six years and they were employed in their present position for five years. They were also employed in the education profession for a median term of eighteen years, and most were employed as a teacher at one time or another. Most of the superintendents belonged to one or more social organizations and so, were likely to be active in their community.

Q. In your district, enrollment in the period from 1961 to 1970 has: (check one)

(1) increased
(2) stayed the same
(3) declined between 0% and 16%
(4) declined between 16% and 24%
(5) declined by more than 24%

A.



This presents some of the most interesting data obtained, in that 19.1 percent of those that responded thought that their enrollment had stayed the same or increased. By further evaluating these responses it was found that about half

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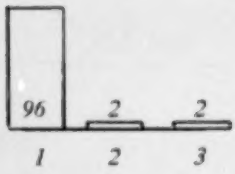
[17]Elise Boulding provided considerable help in the construction of the questionnaire for which the author is grateful. However, all errors remaining are the author's responsibility.

of these answers could be explained by observing that their enrollment had decreased very little or that they had misread the instructions. However, that still leaves 10 percent of the responses showing that they did not know that enrollments had dropped, which is very surprising because state aid is tied directly to the number of ADA's in each district.

Q. In your opinion is the community aware of the above enrollment situation? (check one)

(1) Yes (2) No (3) Don't know

A.

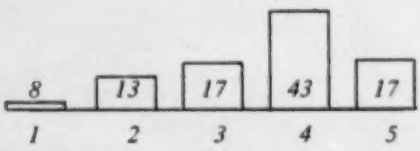


Most of those interviewed thought that the community knew about the enrollment situation. They thought that enrollments had decreased from 1970 to the present which indicates that decline is continuing in most districts. This helps to eliminate one of the problems associated with the tendency to respond to present conditions as was mentioned earlier in this chapter.

Q. In your district enrollment in the period from 1970 to the present has: (check one)

(1) increased by more than 8%
(2) increased between 0% and 8%
(3) stayed the same
(4) decreased between 0% and 8%
(5) decreased by more than 8%

A.

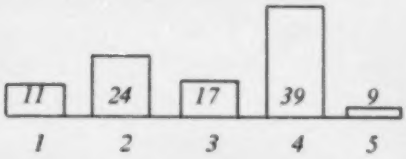


The expectations as to future enrollment are unclear. They expected enrollments to either increase or decrease by 0 percent to 20 percent in the next eight years. The expectations for increasing enrollment probably represented an optimistic view from many of these superintendents.

Q. Your expectations for the enrollment situation in the next eight years are for it to: (check one)

(1) increase by more than 20%
(2) increase by 0% to 20%
(3) stay the same
(4) decrease by 0% to 20%
(5) decrease by more than 20%

A.

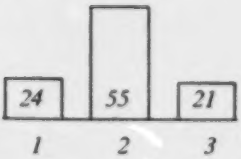


Most of those interviewed attributed the decline in enrollment to the loss of the family farm.

Q. In your opinion what has caused this decline in enrollment? (check one)

(1) loss of industry
(2) loss of the family farm
(3) other (please specify): _____

A.

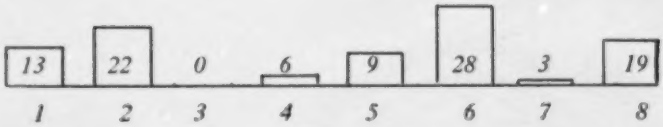


The major problems associated with declining enrollments were due to an excessive teaching staff and obtaining state funding. Their future expectations for major problem areas were primarily the same and consisted of an excessive teaching staff and obtaining both state and local funding.

*Q. Indicate in which of the following areas you have had problems specifically due to the declining enrollment:**

(1) obtaining teaching and/or administrative staff
(2) having an excessive teaching staff
(3) having an excessive administrative staff
(4) the closing of schools
(5) obtaining federal funding
(6) obtaining state funding
(7) obtaining local funding
(8) other (please specify): _____

A.



*Q. Indicate in which of the following areas you believe you will have specific problems with in the future due to your expectations about enrollment:**

(1) obtaining teaching and/or administrative staff
(2) having an excessive teaching staff
(3) having an excessive administrative staff
(4) the closing of more schools
(5) obtaining federal funding
(6) obtaining state funding

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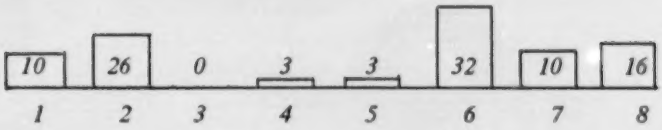
*The response to this question was rank ordered. Therefore the bar graphs represent the distribution of the most important problem.

(7) obtaining local funding
*(8) other (please specify):*_____

A.

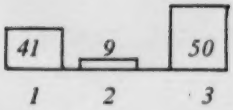


They felt that the community had reacted to the decline in enrollment by maintaining or improving the present quality of education.

Q. In your opinion has the community reacted to the decline in enrollment by: (check one)

(1) maintaining the present quality of education
(2) cutting back on the present quality of education
(3) improving the present quality of education

A.

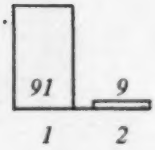


Most thought that CDE (Colorado Department of Education) officials have been aware of the drop in enrollment but have not viewed this decline as a problem. This is an interesting result because the state provides a large amount of funds to these districts and seemingly should be interested in problems that confront the administrator.

Q. In your opinion have Colorado Department of Education (CDE) officials been aware of the enrollment decline in your district: (check one)

(1) Yes (2) No

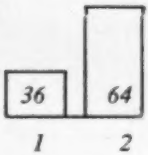
A.



Q. In your opinion have CDE officials viewed this decline as a problem? (check one)

(1) Yes (2) No

A.

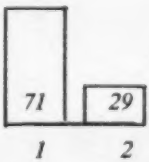


Innovations have taken place and have been locally funded for the most part.

Q. Have any educational innovations (i.e. open schools, programmed teaching, etc.) been experimented with in your district since 1969? (check one)

(1) Yes (2) No

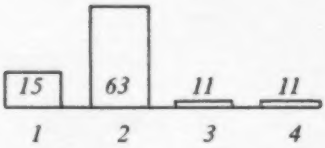
A.



Q. These innovative programs have been primarily funded by: (check one)

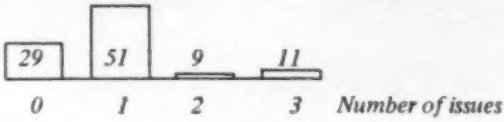
(1) local government
(2) state government
(3) federal government
(4) other (please specify): _____

A.



Q. How many bond issues have been raised in your district since 1960 _____*?*

A.

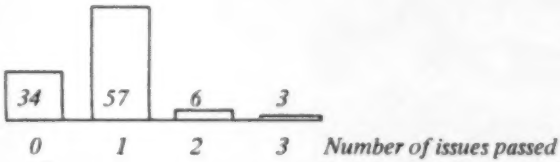


Total of 35 issues raised

Most bond issues have passed but of those that failed, the essential reasons for their failure were apathy and declining enrollments. This verifies the superintendent's response that the communities were maintaining or improving the quality of education in the face of decline.

Q. How many of these issues have passed since 1960 _____*?*

A.

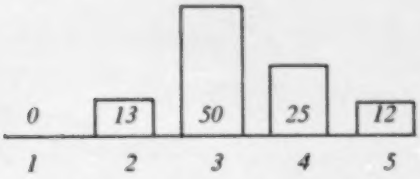


Total of 25 issues passed

Q. *In your opinion what has been the major reason for the failure of the bond issues: (check as many boxes as necessary)*

(1) community apathy
(2) community response to what is being taught in the schools
(3) community unwillingness to tax itself
(4) declining enrollments
(5) other (please specify): _____

A.

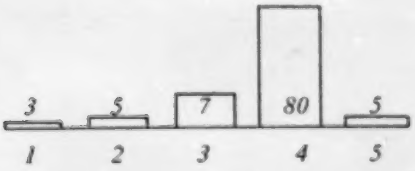


As was expected, the major source of valuation in these districts was agricultural land.

Q. *The major source of property valuation in your district comes from: (check one)*

(1) business
(2) public utility
(3) households
(4) agricultural land
(5) other (please specify): _____

A.



Finally, 85 percent of the superintendents that responded thought the questionnaire was clear.

One of the most important questions that was asked was, "What has been the major aspect of declining enrollment that most troubles you?" A summary of the results is found in Table 9. This shows that the maintenance of a comprehensive program is a very important problem to these administrators. Also forced consolidation and the loss of state funding appear to be important problems. In the "other" category such things as teacher morals, and the desire to know if the decline would stabilize are considered to be important areas of concern.

Table 9

SUMMARY OF THE RESPONSES TO THE QUESTION

CONCERNING THE MAJOR PROBLEM AREA

ASSOCIATED WITH DECLINE

Number of Responses	*Basic Category*
IIIIIIIII	Thought enrollment had stayed the same or increased
III	Misread instructions
II	Community apathy
IIIIII	Maintaining a comprehensive program
III	106% budget limitation based on ADA[18]
III	Inflation
IIII	Forced consolidation
IIII	Loss of state funding
II	Justifying any increase in expenditures
I	Having to reduce staff
IIIIIIIII	Other

[18]This is the state law that allows school districts to increase their budgets by no more than 6% over the previous year's budget, based on ADA.

It is evident from the analysis done in previous sections that decline can be used as an excuse to cut back or to maintain the quality of education provided, or that it can even be used as an excuse to improve the quality of education that is provided. This was asked in the questionnaire and it was found that 41 percent of the respondents thought that the community had reacted to decline by maintaining the quality of education provided and that 50 percent thought that their community had reacted by improving on the present quality of education. There must be some common factor that distinguishes these two types of responses to decline. Therefore in order to isolate this common factor a stepwise discriminate analysis was formulated. One of the two subpopulations consisted of the districts that thought the community had reacted to decline by improving on the present quality of education. The other subpopulation consisted of those districts that responded to decline by maintaining or cutting back on the present quality of education.

The results of this analysis are summarized in Table 10. This shows the number of people classified as rural and discriminates between those districts that reacted to decline by improving on the present quality of education and those that reacted by maintaining or cutting back on the present quality. In these districts the number classified as rural is actually the same as the total population. This indicates that size is important to how a community reacts to decline. The larger communities tend to react to decline in a favorable manner while the smaller communities tend to maintain or cut back on the present quality of education.

C. Conclusion

Administrators perceived several important problem areas associated with decline. Essentially they thought excess teaching staff, loss of state funding, and maintaining a comprehensive program to be the three most important areas of concern. There does not appear to be a problem with unused buildings. This can be explained by observing that the decline has not yet been great enough to close entire buildings. Some of the other hypotheses have been confirmed. The community was aware of the decline in enrollment and even more decline was expected in the future. An interesting result is that the administrators thought that the community was responding to the decline by at least maintaining and sometimes improving on the quality

of education provided. The common factor that explains this community reaction to decline is size. It seems that larger communities react more favorably to decline than smaller communities. For this reason it can be argued that consolidation will improve the quality of education provided when the small local district is faced with declining enrollments. Since innovations were utilized in these districts, one method of response to decline may be for the district to innovate in order to maintain its quality. This hypothesis will be further tested in the next section. Since many districts said they have had problems associated with maintaining a comprehensive program, this is probably an area where decline is forcing quality problems. This has happened

Table 10

SUMMARY OF RESULTS OF DISCRIMINATE ANALYSIS ON THOSE DISTRICTS THAT EITHER IMPROVED OR MAINTAINED THE PRESENT QUALITY OF EDUCATION IN RESPONSE TO DECLINE

Variable Number	*Variable Name*	*Function*		*F Statistic*
		Improve	*Maintain*	
17	Rural Population	.00012	.0021	6.44
		Number of Cases Classified Into Group		
		Improve	*Maintain*	
	Improve	13	4	
	Maintain	5	9	
	Critical F = 4.17 (approximate at .05 level)			

because many of these districts are small and when faced with decline they must cut some programs in order to be financially stable.

This section has answered some of the questions about how districts adjust to decline. The effect of this adjustment on the quality of education provided is still unclear. They appear to adjust by allowing excess capacity to build up in some areas. The larger communities adjust in a more favorable manner than the smaller ones. The next section will attempt to analyze this effect on quality by the use of detailed case studies of five specially selected school districts.

Case Studies of Five Declining School Districts

As pointed out, the problem of declining systems has not been explored by economists in adequate detail. This has led to several problems. First, there have been no data gathered which are designed specifically for the study of decline. In fact, since it seems that most educational institutions are geared toward growth, the data they collect and store also primarily deal with growth. The available data were analyzed by several econometric techniques. This however provided some mixed results. To provide more insight, a questionnaire was formulated and analyzed in the previous section. Even after these techniques were used, there were still many questions that could not be answered.

In order to answer some of the remaining questions a case study approach is used. There are three major questions that this section attempts to answer. The first is, specifically how do school districts adjust to decline? The second is, what are the constraints to efficient education imposed by decline? The last is, what major problems will decline bring about in the future? Traditionally, economists have not used the case study as a method of analysis. They have instead relied on available data as well as that data which could be created when dealing with the problems at hand. Since working with data in terms of means or medians leaves much of the more interesting information, such as that at the tail of the distribution, unexplored, the case study approach is used to overcome this problem. This section is organized into four parts. The first gives a brief description of each district in terms of its primary social and economic characteristics relative to those of all the negative growth districts. The next part outlines the hypotheses that

were tested and the actual questions that were asked each superintendent. The following part gives a summary of the responses and a discussion of what they imply. The conclusion summarizes the results of this analysis.

A. Selection of Districts

Five school districts were selected as the basis of study. Each of these five were chosen because of the nature of decline they exhibited. The selection process was based on both published data and the responses to the questionnaire. All of the districts chosen for the case study had some decline, in terms of ADA, from the 1961-62 school year to the 1969-70 school year. The five major classifications are summarized in Table 11. These were chosen so that the whole spectrum of decline encompassing low, medium, and high rates of decline could be looked at in more detail. It seemed quite plausible that an area with a high rate of decline would have more severe or even far different problems than the district with a low rate of decline.

Table 11

CLASSIFICATIONS OF SCHOOL DISTRICTS FOR CASE STUDIES

District	*Classification*
A	A "typical" declining district
B	A high rate of decline district
C	A low rate of decline district
D	A non-agricultural declining district
E	A district where the superintendent thought enrollment had increased when actually it declined

Since about 10 percent of all superintendents thought their enrollment had increased or stayed the same when in fact it had declined significantly, one of these districts was chosen for study. This was also done to see if there were any differences in adjustment when the superintendent was operating with false information. Since most of the declining districts lay in predominantly agricultural areas, a non-agricultural, metropolitan declining area was also chosen to test for major differences that this type of district may have.

Since personal interviews were used, disclosure was a problem. For this reason, the discussion of the chosen districts is to be done in general terms.

District A, the "typical" district, exhibited many average financial, staff, and socioeconomic characteristics. This district, when compared to all negative growth districts, in the amount of expenditures per student, pupil-teacher ratio, average teacher salary, income per student, and assessed value per ADA, varied less than 10 percent from the respective averages of all negative growth districts. In size related variables such as total population and ADA this district also varied less than 10 percent from the average of all negative growth districts. Therefore in terms of wealth, size, expenditures, the pupil-teacher ratio, and other important variables this district could be labeled the "average" declining district.

District B, the high rate of decline district, had a rate of growth in excess of -25 percent in terms of the change in ADA from the 1961-62 school year to the 1969-70 school year. The total revenues per pupil in this district exceeded the negative growth average by approximately 33 percent. The total mill levy and expenditures per student exceeded this average by about 50 percent. Part of this high level of expenditures can be explained by noting that the pupil-teacher ratio was about 25 percent lower than average and the percent of teachers with an MA was about 40 percent higher than average. This district was also about 33 percent smaller than most other declining districts.

District C, the low rate of decline area, did not have a growth rate exceeding -9 percent in terms of ADA's from 1961 to 1970. It had about 10 percent more in revenues and 12 percent more in expenditures per ADA than the negative growth district averages. The pupil-teacher ratio was 6

percent lower and average teacher salaries 12 percent higher than average. Both the income per student and assessed value per ADA were about 12 percent greater than the negative growth district averages.

District D, the non-agricultural, metropolitan declining area, experienced an almost average rate of decline from 1961 to 1970. The mill levy was about 50 percent greater and the assessed value per ADA 50 percent smaller than the declining district average. Total revenues and current expenditures per ADA were both approximately 10 percent less than the corresponding averages. However, the pupil-teacher ratio and average teacher salaries were about 30 percent greater than that of the negative growth areas. This district was well over ten times the size of the average declining district, and in terms of income it generated over twice the average income per student, as did the majority of the other declining districts.

District E, the district where the superintendent thought enrollments had stayed the same or increased when actually they declined, had a near average rate of decline not differing from that of all negative growth districts by more than 15 percent. The total mill levy was 15 percent less and the assessed value per ADA was about 30 percent greater than the respective declining district averages. The total revenues and current expenditures per ADA were within 8 percent of the negative growth averages. The district was about 20 percent smaller than average and the income per student was about 6 percent less than average.

To summarize, all of these districts had divergences from the negative growth district averages in terms of financing, wealth, size, and so forth. Indeed, this was part of the reason why they were chosen for case studies. The next part will outline the hypotheses that were tested and then will present the actual questions that were asked.

B. Hypotheses That Were Tested

The data and the questionnaire, while very valuable, still left a gap in the analysis of decline. Two major areas remain to be assessed. The first deals with the method of response to decline that a district employs. The second deals with the barriers to efficient decline. In other words, how do the administrators react to declining enrollments and what do they perceive to be barriers to declining efficiency? This section will state the general

hypotheses that were tested and the actual questions that were posed to the five administrators while the following section will give a summary of the results of the interviews.

In order to assess the response to decline the following hypotheses were formulated. First, the declining district would hire a more generally trained teacher, that is, one that could teach a wider variety of courses. This would give the district more flexibility with regard to declining enrollments. Second, decline would lead to the stagnation of the staff because all hiring would cease and therefore the average age of the staff would increase. Therefore stagnation of the staff may be important in explaining variations in the cognitive achievement of the students in declining areas. Since higher costs are generally associated with decline, no innovative programs will be locally funded. Decline will cause under utilization of the present physical structures and therefore no new capital construction will be planned.

There are two main proposed barriers to efficient decline. First, there will be no flexibility in the use of funds. All funds will be budgeted into paying for the larger number of teachers per student and to paying off the existing debt on physical assets. Second, tenure will be an area of concern because of the problems it causes with the creation of excess staff.

The above discussion covers a wide range of the possible problems these districts are expected to face. It is also important to know certain background conditions that exist in each case. These conditions include, for example, community awareness, perceived goals of the community, and expectations of future problems.

C. Summary of Results

A summary of the responses to the interviews is presented in Table 12. The background questions indicated a mixed knowledge of the social and economic characteristics of the community that the school district serves. Another interesting observation was that almost all the superintendents thought that the community gave fine support to the education system.

The hypothesis that the district would adjust to decline by hiring a more generally trained teacher was not confirmed. Only two out of the five superintendents said they were hiring a more generally trained teacher.

Table 12

SUMMARY OF RESPONSES

	District				
	A	*B*	*C*	*D*	*E*
Hypothesis	*Typical*	*High Rate*	*Low Rate*	*Non-Ag*	*Decline*
There was adequate knowledge of the racial mix	Yes	No	Yes	NR*	Yes
The racial mix led to problems in the schools	No	No	No	No	No
There was adequate knowledge of the unemployment rate	Yes	No	Yes	Yes	No
There was adequate knowledge of the poverty level	Yes	No	No	Yes	Yes
The poverty level had an effect on education	Yes	Yes	Yes	NR	Yes
The community has a common set of goals in regard to education	Yes	Yes	No	NR	No
The educational goals are related to other goals of the community	Yes	No	No	NR	No
The community supports the educational system	Yes	No	Yes	Yes	Yes
A more generalized teacher is being hired	No	Yes	Yes	No	No

Table 12 (Continued)

Hypothesis	District A Typical	B High Rate	C Low Rate	D Non-Ag	E Decline
The district has more financial problems than other districts in the state	Yes	Yes	No	No	Yes
There are enough funds to be flexible in the allocation of the funds	Yes	Yes	Yes	No	Yes
The current physical structures act as a barrier to efficient use of funds	No	No	No	No	Yes
There are other barriers (tenure) to the efficient use of funds	Yes	No	No	No	No
The decline in students has seriously upset the financial situation	Yes	No	Yes	No	No
The average age of the teaching staff has increased	Yes	No	No	Yes	No
The average age of the professional staff has increased	No	Yes	Yes	Yes	No
Innovative programs did exist in 1970	No	Yes	Yes	Yes	Yes

Table 12 (Continued)

Hypothesis	District A Typical	B High Rate	C Low Rate	D Non-Ag	E Decline
Local funds were used for most of the innovative programs	NR	Yes	Yes	Yes	No
There are only conventional school buildings in the district	Yes	Yes	Yes	No	Yes
Excess seating capacity exists	Yes	Yes	No	Yes	No
There were unused buildings in 1970	Yes	No	No	No	No
There is no future capital construction planned	Yes	No	Yes	No	Yes

*NR means no response or the question was not applicable.

The hypothesis that decline would lead to financial problems was confirmed to some extent. Three out of the five district superintendents replied that they had more financial problems than most other districts in the state. However, only one superintendent thought that the financial problems were great enough to affect the flexibility in the allocation of funds. In general this lack of serious financial problems agrees with the findings of the rest of the study. Specifically decline has not caused serious financial difficulties because the declining communities are willing to support higher expenditures per student.

The hypothesis relating to the stagnation of the staff was only partially confirmed. Only two superintendents thought that the average age of the teaching staff increased. However, three districts responded that the average age of the professional staff had increased. This indicates that even under conditions of decline the teacher turnover rate is high enough to insure that the teaching staff does not stagnate.

Innovations did take place in four of the five districts and for the most part were locally funded. However, in only one district was the innovation embodied in a physical structure. This indicates that even in declining areas there are enough funds to attempt innovation.

In three of the five districts excess seating capacity existed and in one case there was even an unused building. This shows that decline does yield some under utilization of physical structures.

In only two cases did the superintendents perceive any barrier relating to physical structures or otherwise to the efficient use of funds. The time lag between decline and the response to decline mentioned earlier is a likely explanation for this response.

District A expressed three major problems that would be important in the near future. Maintaining a comprehensive program and the loss of economies of scale were these future problems. The decline in this district would affect the budget critically in the coming school year. When asked about barriers to the efficient use of funds the superintendent responded by saying that "at the present, tenure was not a problem but in the near future it would become a problem."

District B, the high rate of decline area, let its school buildings age considerably and had to eliminate many programs as a response to its decline. When asked what was the major problem area associated with the lack of growth the superintendent responded by stating, "I imagine that the thing that hurt the most was the fact that they felt that losing population caused them to eliminate some of the programs they were proud of years ago." These two problem areas still exist and may become more critical in the future.

District C, the low rate of decline district, had a similar problem in that it could not maintain a comprehensive program. Another problem was the prediction of future enrollment; if this could be done with some degree of accuracy, the response to decline could be better formulated. In fact the superintendent responded that, "Another problem is to try to predict whether the enrollment is to continue or whether it is going to level off or even gain."

District D had two main problem areas associated with decline. The superintendent responded to the question concerning problems associated with decline by stating that "per pupil cost and expanding curriculum were the most important problem areas." In fact this non-agricultural, metropolitan declining district did not appear to have any of the other problems that were common to most of the declining districts, except for some underutilized buildings. This district was very innovative in the types of buildings it constructed. This lack of problems commonly associated with the other districts is probably due to its larger size and nonrural nature.

District E, the district where the superintendent thought that growth had occurred, was similar to the others in that a comprehensive program was the major problem area. Even though the superintendent did not think that decline had occurred it made no difference in how he reacted to decline.

D. Conclusion

These case studies have yielded some interesting insights into problems associated with decline. Almost all of the districts chosen for the case study felt that the maintenance of a comprehensive program was one of the most serious problems they faced. This shows that decline, at least in these rural areas, forces the districts to respond by reducing the variety of programs they offer. This concern shows that they fear that the quality of education they have offered in the past is threatened by decline.

Another problem that was prevalent was the underutilization of physical structures which was exemplified by excess seating capacity. This forced the costs per student to rise and was clearly inefficient. Prediction of decline turning into stability or even growth was only mentioned by one superintendent but this could be the key to the solving of some of the problems associated with decline by allowing long-range planning at the district level.

The responses of the non-agricultural area to decline was very important. The lack of common problems that the other districts faced indicates that both the size of this district and its more urban nature account for significantly different methods of adjustment. This leads to the conclusion that some of the problems that this study found to be associated with decline are actually problems associated with decline in rural areas.